9. (New) The method for etching a silicon wafer using XeF_2 as claimed in claim 8, wherein the XeF_2 gas is injected on the surface of the wafer with a viscous laminar downflow using an injector having a predefined shape provided in the etching chamber for uniform etching of the wafer in step (a).

10. (New) The method for etching a silicon wafer using XeF_2 as claimed in claim 8, further including a step c) of controlling internal pressure of the loading chamber at a level between sublimation pressure of XeF_2 and atmospheric pressure to prevent sublimation of the residual XeF_2 in the loading chamber after the said step (a).

11. (New) The method for etching a silicon wafer using XeF_2 as claimed in claim 8, including weighing the residual XeF_2 gas in the loading chamber at any time during the step (a) to estimate the remaining time for performing the etching step with the residual XeF_2.

12. (New) A method for etching a silicon wafer using XeF_2 , which method comprises:

(a) eliminating air moisture in a loading chamber, an expansion chamber, and an etching chamber by injecting nitrogen to the loading chamber, the expansion chamber or the etching chamber and exhausting the injected nitrogen therefrom; and

(b) thereafter loading XeF_2 in said loading chamber;

(c) collecting sublimated XeF_2 from said loading chamber in said expansion chamber; and

(d) etching said silicon wafer in an etching chamber using XeF_2 supplied from said expansion chamber.